



Indiana Traffic Safety Facts 2003

Motorcycles

<http://www.in.gov/cji>

In 2003, 78 motorcyclists were killed in roadway crashes in Indiana—9 percent fewer than the 86 fatalities reported in 2002, but still the second highest number recorded since 1988.

All information contained within this fact sheet was obtained from the Fatality Analysis Reporting System (FARS) Web-Based Encyclopedia provided by the National Highway Traffic Safety Administration (NHTSA) available online at <http://www-fars.nhtsa.dot.gov/>. All terms and definitions presented in this fact sheet were extracted from the NHTSA Motorcycle Fact Sheet and the definitions that NHTSA applies to the variables in the FARS database, with one important exception. NHTSA includes six different FARS vehicle body types in their definition of “motorcycle”: 1) Motorcycle, 2) Moped (motorized bicycle), 3) Three-wheel Motorcycle or Moped-not All-Terrain Vehicle, 4) Off-road Motorcycle (2-wheel), 5) Other motored cycle type (Minibikes, Motorscooters) and 6) Unknown motored cycle type. However, the national and Indiana analysis presented in this fact sheet pertains only to the first category, motorcycle.

Please note that because of the small number of fatal crashes involving this vehicle type, differences in only a few fatalities from one year to the next could lead to large differences in percentages.

Fatalities, Registrations and Vehicle Miles Traveled

In 2003, 78 motorcyclists were killed in roadway crashes in Indiana. Although this represents 9 percent fewer than the 86 fatalities reported in 2002, it's still the second highest number of motorcyclist fatalities recorded since 1988 (85 fatalities). Between 1999 and 2003, motorcyclist fatalities increased by 30 percent, while motorcycle registrations increased 36 percent over the same period. Indiana's fatality rise mirrored the national trend between 1999 and 2003, where motorcyclist fatalities increased by 49 percent. Despite an increase in the number of motorcyclist fatalities during the past few years, the number of fatalities and the fatality rates in Indiana still remained lower than levels prior to 1987, the first year of the Motorcycle Operator Safety Education Program. In 1987, there were 120 motorcyclist fatalities, and the fatality rate per 100,000 vehicles was 114.38.

In Indiana in 2003, motorcycles comprised 2 percent of all registered vehicles and accounted for only 0.5 percent of all vehicle miles traveled. Conversely, motorcycle occupants represented 9.4 percent of all highway-related fatalities and 10.2 percent of all vehicle occupant fatalities in 2003.

Table 1. Motorcyclist and Passenger Vehicle Fatalities and Fatality Rates in Indiana, 1994–2003

Year	MC Fatalities	Registered Motorcycles	MC Fatality Rate per 100K Registered Motorcycles	MC Vehicle Miles Traveled (millions)	MC Fatality Rate per 100MVT	Passenger Vehicle Fatalities	Passenger Vehicle Miles Traveled (millions)	Passenger Vehicle Fatality Rate per 100MVT
1994	60	89,847	66.78	Not Available	N/A	775	Not Available	N/A
1995	59	89,936	65.60	Not Available	N/A	776	Not Available	N/A
1996	54	90,526	59.65	Not Available	N/A	810	Not Available	N/A
1997	44	92,536	47.55	Not Available	N/A	771	Not Available	N/A
1998	59	97,366	60.60	260.36	22.66	793	60842.35	1.30
1999	60	101,140	59.32	256.78	23.37	820	61641.75	1.33
2000	68	114,293	59.50	260.62	26.09	714	62551.56	1.14
2001	69	120,062	57.47	334.19	20.65	741	63968.61	1.16
2002	86	128,013	67.18	355.43	24.20	623	64642.97	0.96
2003	78	137,788	56.61	353.94	22.04	644	64359.30	1.00

Table includes all motorcycle drivers and passengers suffering a fatal injury in a roadway crash. Fatality Rates and Vehicle Miles Traveled have been rounded to the nearest hundredth for presentation.

Sources: Fatal Injuries – Fatality Analysis Reporting System (FARS), NHTSA, as of 8/20/04. Registered Vehicles – Indiana BMV. Vehicle Miles Traveled – Indiana Department of Transportation.

Per vehicle mile, motorcyclists were 22 times as likely as passenger vehicle occupants to die in a motor vehicle crash.

Per vehicle mile traveled in 2003, motorcyclists were 22 times as likely as passenger-vehicle occupants to die in a motor vehicle crash. Between 1999 and 2003, the passenger-vehicle fatality rate per 100 million vehicle miles traveled decreased 24.8 percent, while the motorcycle fatality rate decreased only 5.7 percent.

Driver Age

Nationwide between 1999 and 2003, there was a more dramatic increase in the number of older riders involved in fatal motorcycle crashes than the number of younger riders involved. The number of motorcycle drivers age 40 and above involved in fatal crashes increased from 951 to 1,677 (a 76 percent increase for this five-year period.) The number of motorcycle drivers below age 40 involved in fatal crashes increased at a much slower rate, from 1,463 to 1,937 (a 32 percent increase.) In 1999, 39 percent of all motorcycle drivers involved in a fatal crash were age 40 and above, compared to 46 percent in 2003.

However, in Indiana between 1999 and 2003, the number of motorcycle drivers age 40 and above involved in fatal crashes decreased from 31 to 30 (a 3 percent decrease). The number of motorcycle drivers below age 40 involved in fatal crashes increased from 29 to 49, (a 69 percent increase.) The age composition of motorcycle drivers involved in fatal crashes in Indiana is subject to much higher variability from year to year because there are fewer drivers involved in crashes each year. However, when five years of data are combined, Indiana mirrors the national trend. Between 1994 and 1998, 27 percent of all motorcycle drivers involved in Indiana fatal crashes were age 40 and above, compared to 41 percent for 1999–2003. (These numbers are similar to the corresponding nationwide figures of 29 percent and 43 percent.)

Table 2. Motorcycle Drivers Involved in Fatal Crashes by Age, 1994–2003

Year	United States				Indiana			
	<40	40+	Total	Percent 40+	<40	40+	Total	Percent 40+
1994	1,683	511	2,194	23%	51	11	62	18%
1995	1,614	530	2,144	25%	46	16	62	26%
1996	1,440	614	2,054	30%	41	11	52	21%
1997	1,373	696	2,069	34%	28	15	43	35%
1998	1,473	748	2,221	34%	38	24	62	39%
1994-1998 Total	7,583	3,099	10,682	29%	204	77	281	27%
1999	1,463	951	2,414	39%	29	31	60	52%
2000	1,678	1,174	2,852	41%	46	22	68	32%
2001	1,881	1,252	3,133	40%	47	31	78	40%
2002	1,784	1,447	3,231	45%	50	37	87	43%
2003	1,937	1,677	3,614	46%	49	30	79	38%
1999-2003 Total	8,743	6,501	15,244	43%	221	151	372	41%

Drivers of unknown age are excluded. Sources: Fatal injuries – Fatality Analysis Reporting System (FARS), NHTSA, as of 8/20/04.

Crash Characteristics

NHTSA defines fixed objects as “stationary structures or substantial vegetation attached to the terrain.” For a particular vehicle in a fatal crash, the most harmful event is defined as “the event during a crash for a particular vehicle that is judged to have produced the greatest personal injury or property damage.” In Indiana in 2003, 18 percent of motorcycles involved in fatal crashes (14 out of 79) experienced a collision with a fixed object as the most harmful event in the crash, compared to 19 percent for passenger cars, 13 percent for light trucks and 3 percent for large trucks.¹ (In 2002, 40 percent of all motorcycles involved in fatal crashes experienced a collision with a

¹ Note that vans and utility vehicles are included in NHTSA’s definition of light trucks.

fixed object as the most harmful event in the crash, a rate substantially higher than that for all other vehicle types.) Of all the different fixed objects that these 14 motorcycles collided with in 2003, trees were hit with the highest frequency. Thirty-six percent of the 14 motorcycles (5 motorcycles) collided with a tree.

Thirty-seven percent (29 out of 79) of all motorcycles involved in fatal crashes in 2003 were in a single-vehicle crash. Thirty-four percent of these motorcycles (10 motorcycles) were attempting to negotiate a curve when the crash occurred.

The remaining 50 motorcycles involved in fatal crashes in 2003 were in a multiple-vehicle crash. Three of the 50 motorcycles were in crashes involving a total of 3 or 5 vehicles. The other 47 were in two-vehicle fatal crashes. All 47 experienced a collision with the other vehicle in the crash as the first harmful event of the crash. One of these motorcycles had an unknown initial impact point, but of the 46 with known initial impact point, 85 percent (39 motorcycles) were initially impacted in the front, and only 4 percent (2 motorcycles) were initially impacted in the rear. Of the 39 motorcycles initially impacted in the front, 49 percent (19 motorcycles) contacted the side of the other vehicle at a right angle.

The 47 motorcycles involved in two-vehicle fatal crashes accounted for only 44 different crashes. Three fatal motorcycle crashes involved a collision between two motorcycles, three crashes involved a motorcycle and an other unknown vehicle type, and the other 38 involved a collision between a motorcycle and a different vehicle type. In 8 of these 38 fatal crashes (21 percent) the other vehicle was turning left while the motorcycle was going straight, passing, or overtaking the vehicle. Both vehicles were going straight in 19 crashes (50 percent).

NHTSA considers a crash to be **speeding-related** if the driver was charged with a speeding-related offense or if an officer indicated that racing, driving too fast for conditions, or exceeding the posted speed limit was a contributing factor in the crash.

In 2003, 37 percent of the 79 motorcycle drivers involved in Indiana fatal crashes were speeding, nearly twice the rate for drivers of passenger cars (20 percent of 523 drivers) and 3.2 times the rate for drivers of light trucks (11 percent of 438 drivers).

In 2003, 37 percent of all motorcycle drivers involved in Indiana fatal crashes were speeding, 1.8 times the rate for drivers of passenger cars and 3.2 times the rate for drivers of light trucks.

Licensing

In Indiana, 22 percent of the 79 motorcycle operators involved in fatal crashes in 2003 were operating the vehicle with an invalid license at the time of the collision (either not licensed at all or without a valid license to operate a motorcycle). This rate was nearly twice the rate for passenger-vehicle drivers involved in fatal crashes in Indiana (12 percent), but lower than the nationwide rate for motorcycle drivers (24 percent).²

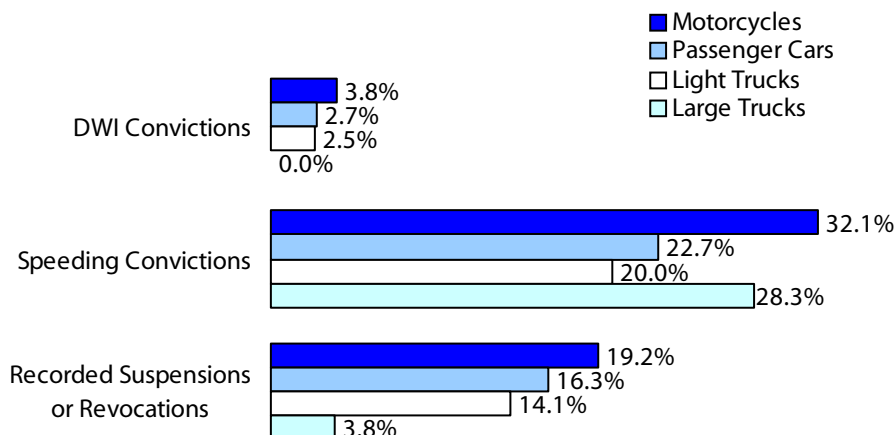
In Indiana in 2003, when compared to other vehicle operators, motorcycle operators involved in fatal crashes had the highest incidence of previous convictions for driving while intoxicated, previous speeding convictions and previous suspensions or revocations of their license.

Of all motorcycle operators in fatal crashes, 19.2 percent had a previous suspension or revocation, compared to 15.3 percent of passenger-vehicle operators; 32.1 percent had a previous speeding conviction, compared to 21.5 percent of passenger-vehicle operators; and 3.8 percent had at least one previous conviction for driving while intoxicated on their driver records, compared to 2.6 percent of passenger-vehicle operators.

² Passenger vehicles are defined by NHTSA as all passenger cars and light trucks.

In 2003, 22 percent of the 79 motorcycle operators involved in fatal crashes were operating the vehicle with an invalid license at the time of the collision.

Figure 1. Previous Driving Records of Drivers Involved in Fatal Traffic Crashes in Indiana, by Type of Vehicle, 2003



Sources: Fatality Analysis Reporting System (FARS), NHTSA, as of 8/20/04.

Alcohol

Unfortunately, known blood alcohol content (BAC) test results are not available for all drivers involved in fatal crashes. Missing data can result for a number of reasons, the most frequent of which is that persons are not always tested for alcohol. In 2001, NHTSA began using a revised statistical method—multiple imputation—to estimate missing information about blood alcohol concentration levels for persons involved in fatal crashes. All of the information presented in this fact sheet pertaining to alcohol is based on the new imputation method. Alcohol rates are estimates that represent a mix of both known and estimated BACs. More information on the new multiple imputation method, including detailed tabulations of alcohol involvement in various categories (age, gender, time of day, etc.), is available in NHTSA's Technical Report DOT HS 809 403, "Transitioning to Multiple Imputation: A New Method to Estimate Missing Blood Alcohol Concentration (BAC) Values in FARS."

In 2003, the estimated rate of alcohol involvement (blood alcohol concentration of .01 grams per deciliter or greater) for motorcycle operators involved in Indiana fatal crashes was about twice the estimated rate for passenger-vehicle drivers (41 and 19 percent, respectively). Motorcycle operators involved in Indiana fatal crashes in 2003 also had higher estimated intoxication rates (BAC of .08 grams per deciliter or greater) than any other type of motor-vehicle driver. Estimated intoxication rates for vehicle operators involved in fatal crashes were 31 percent for motorcycles, 15 percent for passenger cars, 17 percent for light trucks and 1 percent for large trucks.

In 2003, there were 30 motorcycle drivers involved in fatal crashes age 40 and above, 40 drivers age 21 to 39 and 9 drivers age 0 to 20. The estimated intoxication rate for motorcycle drivers was highest for operators age 40 and above (40 percent), followed by ages 21 to 39 (28 percent) and ages 0 to 20 (14 percent). These intoxication rates do not follow the trend seen in passenger-vehicle drivers. The estimated intoxication rate for passenger-vehicle drivers was highest for operators age 21 to 39 (23 percent), followed by ages 40 and above (12 percent) and 0 to 20 (11 percent).

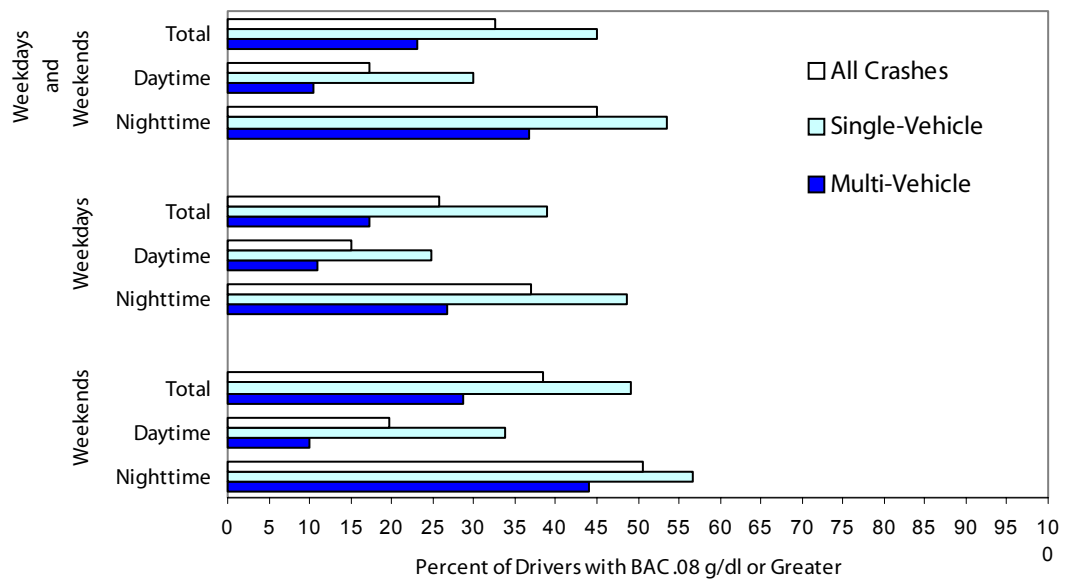
In Figure 2, five years of data (1999–2003) have been combined so that motorcycle drivers involved in fatal crashes can be broken down into day of week, time of day and type of crash to compare intoxication rates. Almost half (73 out of 162) of the motorcycle operators involved in fatal single-vehicle crashes in 1999–2003 were estimated to be intoxicated. Fifty-seven percent (34 out of 60) of the operators involved in single-vehicle fatal crashes on weekend nights were estimated to be intoxicated.

There were 197 motorcycle operators involved in fatal traffic crashes at night (6:00 PM–5:59 AM) and 170 involved in fatal traffic crashes during the day (6:00 AM–5:59 PM). Five drivers were involved in a crash where the time of day was not known. Drivers involved in crashes at night were 2.6 times as likely to be intoxicated as those involved during the day (45 percent and 17 percent, respectively).

In 2003, motorcycle operators involved in fatal crashes had higher intoxication rates than drivers of all other types of vehicles.

Almost half of the motorcycle operators involved in fatal single-vehicle crashes in 1999–2003 were intoxicated.

Figure 2. Intoxication Rates for Motorcycle Operators Involved in Fatal Traffic Crashes in Indiana, by Time of Day, 1999–2003



Daytime: 6:00 AM to 5:59 PM

Nighttime: 6:00 PM to 5:59 AM

Weekday: Monday 6:00 AM to Friday 5:59 PM

Weekend: Friday 6:00 PM to Monday 5:59 AM

Sources: Fatality Analysis Reporting System (FARS), NHTSA, as of 8/20/04.

Please note that the estimations produced by the imputation model have been rounded to the nearest whole number of operators for presentation in the text of this fact sheet. However, all percentages referenced in the text of this fact sheet and appearing in Figure 2 have been computed from unrounded data.

NHTSA reports that helmets are estimated to be 37 percent effective in preventing fatal injuries to motorcyclists.

Helmets

NHTSA estimates that helmets are 37 percent effective in preventing fatal injuries to motorcyclists. All motorcycle helmets sold in the United States are required to meet Federal Motor Vehicle Safety Standard 218, the performance standard which establishes the minimum level of protection that helmets must afford each user.

In 2003, there were 20 states plus the District of Columbia and Puerto Rico that required helmet use by all motorcycle operators and passengers. (One of these states, Pennsylvania, only had such a law for the majority of the year 2003. On September 4, 2003, helmet use became optional for persons 21 years of age or older who either have been licensed to operate a motorcycle for not less than two full calendar years or have completed a motorcycle rider safety course approved by the department or the Motorcycle Safety Foundation. Passengers age 21 and older riding with a driver exempt from the law also became exempt.) In another 27 states, only persons under a specific age, (usually 18), or meeting some other criteria (usually related to insurance and/or experience), were required to wear helmets. Three states had no laws requiring helmet use. Indiana law requires all riders (operators and passengers) under the age of 18 to wear a helmet. Indiana law also requires all operators holding only an instructional permit (a temporary learner's permit or a learner's permit) to wear a helmet. (Operators holding only an instructional permit can not carry passengers.)

In 2003, for the 76 (out of 78) fatally injured motorcyclists (operators and passengers) in Indiana with known helmet use, the reported helmet use rate was 26 percent, higher than the rate in 2002 (11 percent). The 2003 rate was considerably lower, however, than that of the entire nation (54 percent), as well as the 30 states without a law requiring all riders to wear a helmet (29 percent).

In 2003, the reported helmet use rate for intoxicated motorcycle operators (BAC of .08 grams per deciliter or greater) involved in Indiana fatal traffic crashes was estimated to be 6 percent, compared with 33 percent for those who were sober (BAC of .00 grams per deciliter).

Table 3. 2003 Indiana Motorcyclist Fatalities by County

County	2003				
	Total Traffic Fatalities	Motorcyclist Fatalities	Percent of Total	Registered Motorcycles	Motorcyclist Fatalities per 1,000 Registered Vehicles
Adams	9	1	11.1	815	1.23
Allen	23	2	8.7	6,495	0.31
Bartholomew	11	0	0.0	1,712	0.00
Benton	4	0	0.0	194	0.00
Blackford	2	0	0.0	348	0.00
Boone	11	1	9.1	1,232	0.81
Brown	1	1	100.0	635	1.57
Carroll	4	0	0.0	574	0.00
Cass	4	1	25.0	918	1.09
Clark	3	0	0.0	1,837	0.00
Clay	4	0	0.0	773	0.00
Clinton	10	0	0.0	904	0.00
Crawford	3	1	33.3	207	4.83
Daviess	8	2	25.0	583	3.43
Dearborn	11	1	9.1	1,314	0.76
Decatur	10	1	10.0	555	1.80
DeKalb	16	0	0.0	1,140	0.00
Delaware	10	0	0.0	2,092	0.00
Dubois	7	1	14.3	885	1.13
Elkhart	21	3	14.3	4,349	0.69
Fayette	1	0	0.0	541	0.00
Floyd	6	1	16.7	1,353	0.74
Fountain	3	0	0.0	359	0.00
Franklin	7	0	0.0	625	0.00
Fulton	4	1	25.0	609	1.64
Gibson	10	0	0.0	808	0.00
Grant	8	0	0.0	1,920	0.00
Greene	1	0	0.0	813	0.00
Hamilton	22	2	9.1	4,327	0.46
Hancock	6	1	16.7	1,727	0.58
Harrison	11	0	0.0	784	0.00
Hendricks	10	0	0.0	3,326	0.00
Henry	12	1	8.3	1,438	0.70
Howard	12	0	0.0	2,620	0.00
Huntington	3	0	0.0	960	0.00
Jackson	8	0	0.0	962	0.00
Jasper	6	0	0.0	842	0.00
Jay	2	1	50.0	563	1.78
Jefferson	3	1	33.3	724	1.38
Jennings	9	3	33.3	688	4.36
Johnson	14	0	0.0	3,259	0.00
Knox	3	0	0.0	714	0.00
Kosciusko	16	1	6.3	1,777	0.56
LaGrange	8	0	0.0	684	0.00
Lake	54	2	3.7	8,935	0.22

Table 3. 2003 Indiana Motorcyclist Fatalities by County (continued)

County	2003				
	Total Traffic Fatalities	Motorcyclist Fatalities	Percent of Total	Registered Motorcycles	Motorcyclist Fatalities per 1,000 Registered Vehicles
LaPorte	29	0	0.0	2,981	0.00
Lawrence	8	0	0.0	1,213	0.00
Madison	18	2	11.1	3,265	0.61
Marion	86	19	22.1	14,365	1.32
Marshall	11	1	9.1	1,323	0.76
Martin	4	1	25.0	207	4.83
Miami	6	1	16.7	1,367	0.73
Monroe	10	1	10.0	2,151	0.46
Montgomery	7	0	0.0	888	0.00
Morgan	9	0	0.0	2,378	0.00
Newton	5	0	0.0	478	0.00
Noble	3	0	0.0	972	0.00
Ohio	1	0	0.0	143	0.00
Orange	0	0	N/A	461	0.00
Owen	5	0	0.0	539	0.00
Parke	3	0	0.0	358	0.00
Perry	9	0	0.0	452	0.00
Pike	1	0	0.0	300	0.00
Porter	16	5	31.3	4,720	1.06
Posey	2	0	0.0	669	0.00
Pulaski	3	1	33.3	389	2.57
Putnam	3	0	0.0	866	0.00
Randolph	5	1	20.0	783	1.28
Ripley	0	0	N/A	663	0.00
Rush	8	0	0.0	469	0.00
Saint Joseph	30	6	20.0	5,386	1.11
Scott	2	0	0.0	582	0.00
Shelby	3	1	33.3	1,238	0.81
Spencer	4	0	0.0	435	0.00
Starke	1	0	0.0	667	0.00
Steuben	15	1	6.7	815	1.23
Sullivan	2	0	0.0	424	0.00
Switzerland	3	0	0.0	212	0.00
Tippecanoe	15	1	6.7	2,755	0.36
Tipton	4	1	25.0	537	1.86
Union	0	0	N/A	192	0.00
Vanderburgh	20	2	10.0	3,228	0.62
Vermillion	5	0	0.0	454	0.00
Vigo	11	1	9.1	1,947	0.51
Wabash	7	0	0.0	1,071	0.00
Warren	2	0	0.0	174	0.00
Warrick	13	1	7.7	1,374	0.73
Washington	5	1	20.0	806	1.24
Wayne	11	1	9.1	1,621	0.62
Wells	2	0	0.0	731	0.00
White	10	0	0.0	593	0.00
Whitley	6	1	16.7	867	1.15
Total	834	78	9.4	137,788*	0.57

*Please note that the statewide registered motorcycle total includes 359 motorcycles registered as "special sales" and not attributed to a particular county.

Table includes all motorcycle drivers and passengers suffering a fatal injury in a roadway crash.

Sources: Fatal Injuries – Fatality Analysis Reporting System (FARS), NHTSA, as of 8/20/04.

Registered Vehicles – Indiana BMV.

Conclusions

Indiana has made great strides in reducing both the number of motorcyclist fatalities and the motorcyclist fatality rate per registered vehicle since the late 1980s. In addition, total motorcyclist fatalities decreased from 86 in 2002 to 78 in 2003, and the 2003 motorcyclist fatality rates per vehicle mile traveled and per registered vehicle were not any higher than the rates in 1999. However, the 78 fatalities recorded in 2003 was still the second highest number of fatalities recorded since 1988, and over the past five years Indiana has mirrored a nationwide trend of increasing registrations and fatalities (particularly among those 40 and above). Motorcycle crashes have clearly emerged as an important traffic safety issue both for the United States and the state of Indiana. Fatal crash statistics reveal that both speeding and alcohol are particular problem areas, especially when compared to other vehicles.

This publication was prepared on behalf of the Indiana Criminal Justice Institute by Purdue University's Center for the Advancement of Transportation Safety. All information contained within was gathered from the Fatality Analysis Reporting System (FARS) Web-Based Encyclopedia provided by the National Highway Traffic Safety Administration (NHTSA) available at <http://www.fars.nhtsa.dot.gov>. All figures are considered current as of August 20, 2004. Please direct any questions concerning data in this document to the Center for the Advancement of Transportation Safety, Purdue University, 1291-F Cumberland Ave., West Lafayette, IN 47906-1385, 765-494-7038.
